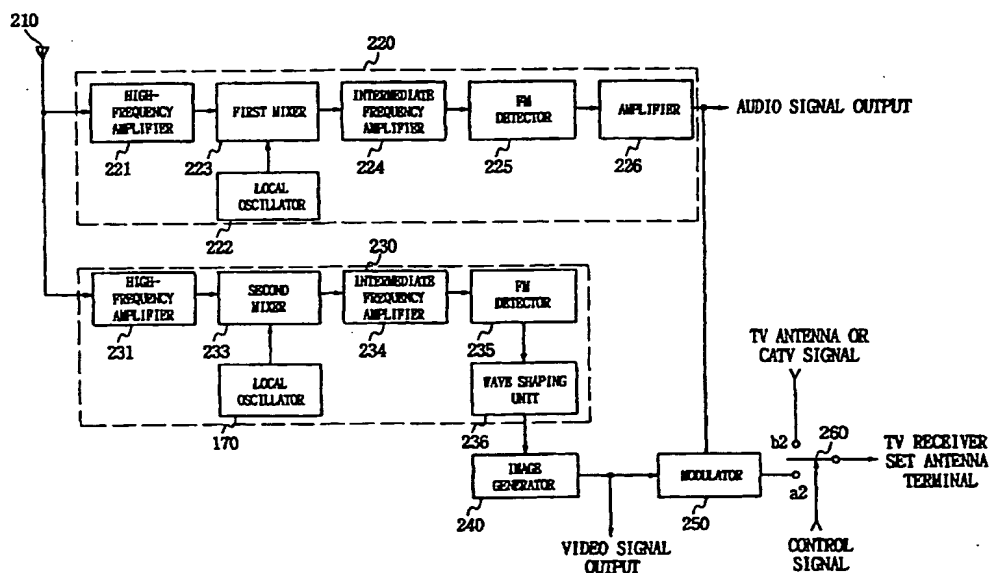




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(54) Title: MICROPHONE AND RECEIVER FOR AUTOMATIC ACCOMPANIMENT



(57) Abstract

The present invention relates to a microphone and receiver for automatic accompaniment in which the microphone serves to output a mixed audio signal of a selected melody and a song voice signal resulting from singing a song to the accompaniment of the selected melody and an image control data corresponding to the accompaniment melody, and store and play the mixed audio signal and/or song voice signal to output it, and in which the receiver receives the mixed audio signal and/or the song voice signal outputted from the microphone to output to a television receiver set, and at the same time generate a caption image corresponding to the song words and background image according to the received image control data to output to the television receiver set.

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MICROPHONE AND RECEIVER FOR AUTOMATIC ACCOMPANIMENT

Technical Field

The present invention relates to a microphone for automatic accompaniment and
5 a receiver therefor, and more particularly to a microphone for automatic accompaniment
and a receiver therefor in which the microphone serves to output a mixed audio signal of
a selected melody and a song voice signal resulting from singing a song to the
accompaniment of the selected melody and an image control data corresponding to the
accompaniment melody, and store and play the mixed audio signal and /or song voice
10 signal to output it, and in which the receiver receives the mixed audio signal and /or the
song audio signal outputted from the microphone to output to a television receiver set,
and at the same time generate a caption image corresponding to the song words and
background image according to the received image control data to output to the
television receiver set.

15 Background Art

Generally, a wireless microphone serves to convert a sound wave signal into an
electronic signal having frequencies in the zone of FM signal to be sent to a FM receiver
provided to audio systems such as a radio, cassette tape recorder and the like, and the
signal outputted from the wireless microphone is also output through a speaker
20 provided within or outside the system.

If the audio systems are provided with playback means by which accompaniment
melody-data recorded in an audio tape are played-back, an audio signal output from the
wireless microphone is synthesized to an accompaniment melody, thereby a user can

sing a song to the accompaniment of the melody.

However, there is a problem in the conventional system in that the audio tape and the like are rapidly wound and re-wound to select an accompaniment melody for a song and thereafter a playback key must be pushed to play-back the accompaniment melody, thereby causing much inconvenience and spending a lot of time in operating the audio systems.

Also, in the conventinal systems, there is another problem in that since the number of the accompaniment melody recorded in an audio tape is limited to about 15 to 20 pieces, a user have to purchase a number of audio record tapes to have a lot of accompaniment melody.

Meanwhile, lyrics accompaniment devices (what is called "a karaoke device") are well known as devices for practicing singing a song. The lyrics accompaniment devices are provided therein with a monitor, hardware system and microphone, as integrated with each other, wherein an accompaniment melody selected by a user is output through a speaker and at the same time a corresponding subtitle, song words and background image appears on the screen of the monitor.

The lyrics accompaniment devices enable changing continuously the color of the subtitle or song words on the screen while the selected melody is output through the speaker.

Such lylics accompaniment devices are provided with memory unit in the hardware system and serve to store a number of accompaniment melody therein, so that a user can select a desired accompaniment melody among the stored accompaniment melody to sing a song to the accompaniment of the melody.

However, the lyrics accompaniment devices are complex in structure and are large in its volume, thereby causing inconvenience in carrying it.

In contrast, the lyrics accompaniment devices disclosed in the Korean patent No. 93362 registered in Korea are provided within a microphone provided therein with
5 memory units for storing a number of accompaniment melody to be selected by a user and. In the lyrics accompaniment devices provided in the microphone, a song voice signal and an accompaniment melody are mixed to thereafter be converted into a FM signal and to outputted, thereby a user with the microphone can sing a song to the accompaniment of the selected melody everywhere a FM receiver and (or) television
10 receiver set are (is) present regardless of time and places.

However, there is a problem in the lyrics accompaniment devices disclosed in the Korean Patent No. 93362 in that the device is not provided with storing means and playing means by which user's songs are stored and output respectively, so the user cannot confirm whether or not he exactly sing a song to the accompaniment of the
15 melody.

In addition, the lyrics accompaniment device disclosed in the application No. 96-7198 filed in Korea prior to filling the present invention is provided within a microphone which is provided with memory units in which accompaniment melody, background image and song caption image are stored, the accompaniment melody selected by a user,
20 the background image and caption image corresponding to the melody are converted into a FM signal to be output, and a song voice signal is also converted into a FM signal to be output, thereby the user can sing a song to the accompaniment of the melody everywhere a FM receiver and/or television receiver set is (are) present regardless of the

time and places.

However, there is a problem in the lyrics accompaniment devices disclosed in the Korean Patent Application No. 7198 in that the device is not provided with storing means and playing means by which user's songs are stored and output respectively, so
5 the user cannot confirm whether or not he exactly sing a song to the accompaniment of the melody.

In addition, there is a problem in the lyrics accompaniment device in that because the background image and song caption image corresponding to the accompaniment melody are transmitted from the microphone to appear on the screen of
10 the television set, the image which appears on the screen of the television receiver set waves in response to motion of the user with the microphone.

Disclosure of Invention

It is an object of the invention to provide a microphone for automatic accompaniment which stores and outputs a song voice signal resulting from a user's
15 song according to the accompaniment melody or a mixed sound signal resulting from the user's song to the accompaniment of selected melody.

It is another object of the invention to provide a microphone for automatic accompaniment and a receiver for receiving a signal from the microphone in which the microphone serves to transmit a mixed voice signal, a background image corresponding
20 to the accompaniment melody and an image control data of the song caption image, and in which the receiver serves to receive the song voice signal resulting from the user's song and/or the mixed voice signal outputted from the microphone for automatic accompaniment to transmit it to the television receiver set and at the same time generate

a caption image of song words and a background image according to the received image control data.

In order to achieve the object, the microphone for automatic accompaniment according to the present invention comprises record/playback means and

5 accompaniment melody/song voice signal output means for outputting a song voice (audio) signal or a mixed voice(audio) signal mixed with the song voice signal, and the mixed voice signal outputted from the accompaniment melody/song voice signal output means is stored by the record/playback means and converted into a FM signal by a transmitting means to be transmitted to a receiver.

10 A song to the accompaniment of melody is completed, and when a user selects a playback operation, the mixed voice signal stored in the record/playback means or the song voice signal is reproduced through the record/playback means and transmitted with a FM signal through the transmitting means.

The record/playback means comprises a memory unit, an analogue-to-digital
15 converter and a digital-to-analogue converter. The analogue/digital converter converts the output signal signal outputted from the accompaniment melody/song voice (audio) signal into a digital signal to be stored through the memory unit. In the case of reproducing the stored signal, the stored signal is outputted from the memory unit and converted into an analogue signal through the digital to analogue converter to be
20 outputted.

In order to achieve the another object, according to the microphone for automatic accompaniment and receiver therefor, the microphone serves to transmit the song voice (audio) signal or the mixed voice signal together with the image control data of the

background image and song caption image according to the accompaniment melody.

The receiver receives the song voice signal or the mixed voice signal transmitted from the microphone to output it to the television receiver set, and at the same time serves to generate a song caption image and a background image for accompaniment melody according to the received image control data to thereafter output the generated images to the television receiver set so that the images appear on the screen of the television set.

Brief Description of Drawings

The present invention may be better understood, and its numerous objects, features, and advantages made apparent to those skilled in the art by reference to the accompanying drawings, in which the use of the same reference symbols in different drawings indicates similar or identical items.

Fig. 1 is a perspective view showing a microphone and a receiver therefor according to the present invention;

Fig. 2 is a block diagram illustrating a microphone for automatic accompaniment according to an embodiment of the present invention;

Fig. 3 is a circuit diagram illustrating image control data transmitting means as shown in Fig. 2.; and

Fig. 4 is a block diagram showing a receiver according to the present invention.

Best Mode for carrying out the Invention

Hereinafter, preferred embodiments of the present invention will now be described with reference to the attached drawings.

Fig. 1 is a perspective view showing the microphone for automatic

accompaniment and a receiver therefor according to the present invention.

Referring to Fig. 1, reference numeral 100 indicates the microphone for automatic accompaniment. The microphone 100 serves to store the accompaniment melody selected by a user and the mixed voice signal mixed with the song voice signal according to the accompaniment melody, to convert the mixed voice signal into a FM signal to transmit it, and to convert the image control data according to the selected accompaniment melody into a FM signal to transmit it.

Reference numeral 200 indicates a receiver according to the present invention.

The receiver 200 serves to receive the mixed voice signal transmitted from the microphone 100 for automatic accompaniment to output it to the television receiver set 300, to generate a caption image of song words and a background image according to the image control data transmitted from the microphone 100, and to output the background image and caption image to the television receiver set 300 so that the images appear on the screen the television receiver set 300.

Fig. 2 is a block diagram showing the microphone 100 for automatic accompaniment according to an embodiment of the present invention.

The microphone 100 for automatic accompaniment as shown in Fig. 2 comprises a system controller 110 for controlling transmission of a song and an accompaniment melody selected by user's manipulation, for controlling store and playback, and for controlling transmission of image control data corresponding to caption image for song words and a background image according to the selected accompaniment; a key input means 120 for inputting an operation instruction into the system controller 110; display means 130 for displaying an operation state in response to control of the system

controller 110; mixed voice signal output means 140 for outputting an accompaniment melody selected by a user according to control of the system controller 110 and at the same time mixing the song voice signal and the accompaniment melody; record and playback means 150 for storing and outputting the mixed voice signal of the mixed voice signal output means 140 in response to control of the system controller 110; a switch 160 for outputting selectively the output signal of the output means 140 and record/playback means 150 in response to control of the system controller 110; transmitting means 170 for converting the mixed voice signal selected by the switch 160 into a FM signal to transmit it through an antenna 180; and image data transmitting means 190 for converting the image control data outputted from the system controller 110 into a FM signal to transmit it through the antenna 180.

The mixed voice signal output means 140 comprises accompaniment melody store means 141 for storing in separate zone of memory units accompaniment melody data for lyrics, nursery songs, hymn and the like to thereafter output the selected accompaniment melody in response to control of the system controller 110, accompaniment melody synthesizing means 142 for controlling the accompaniment melody output from the store means 141 in response to control of the system controller 110 to synthesize and output the corresponding echo signal, a digital-to-analogue converter 143 for converting the output signal of the accompaniment melody synthesizing means 142 to an analogue signal, a filter 144 for filtering the output signal of the converter 143, an amplifier 145 for amplifying the output signal of the filter 144, an amplifier 147 for amplifying a song sound signal inputted through a microphone 146, echo means 148 for echoing the output signal of the amplifier 147 in response to control

of the system controller 110, mixing means 149 for mixing the output signals of the amplifier 145 and echo means 148.

The accompaniment melody synthesizing means 142 includes a digital signal processing unit 1421 for converting the accompaniment melody read by the store means 141 into a digital signal, an accompaniment melody synthesizer unit 1422 for synthesizing the output signal of the digital signal processing unit 1421 into an accompaniment melody signal, and echo signal synthesizer unit 1423 for echoing the signal synthesized in the accompaniment melody synthesizer unit 1422 in response to a user's selection.

10 The record and playback means 150 comprises an analogue-to-digital converter 151 for converting the output signal of the mixed voice signal output means 140 into a digital signal, a memory unit 152 for storing and outputting the output signal of the analogue/digital converter 151 in response to control of the system controller 10, and a digital to analogue converter 153 for converting the output signal of the memory unit 152 into an analogue signal to thereafter output it to the switch 160.

The image control data transmitting means 190, as shown in the Fig. 3, comprises a FM modulator 191, a first amplifier 192 and a second amplifier 193. The FM modulator 191 generates a FM modulating signal while a crystal XTAL oscillates according to a time constant of oscillation predetermined by a variable capacitance diode VD, condenser C2 and coil L1, where the variable capacitance diode VD varies in its capacitance according to the the image control data outputted from the system controller 110. The first amplifier 192 serves to amplify the output signal of the FM modulator 191 with a transistor Q1. The second amplifier 193 serves to amplify the output signal of the

first amplifier 192 with transistors Q2 and Q3 to thereafter transmit it through the antenna 180.

With the microphone for automatic accompaniment thus constructed, if a user selects a desired song by manipulating the key input means 120 provided within the microphone prior to singing a song, the system controller 110 is activated to determine the desired accompaniment melody to display it through the display means 130, and also to output the desired accompaniment melody through the accompaniment melody store means 141 and at the same time output the image control data according to the accompaniment melody to the image control transmitting means 190.

The accompaniment melody outputted from the accompaniment melody store means 141 is input into the accompaniment melody synthesizing means 142 through the system controller 110 so that the accompaniment melody is synthesized and outputted.

That is to say, the accompaniment melody outputted from the accompaniment melody store means 141 is processed in the digital signal processing unit 1421 of the accompaniment melody synthesizing means 142 as a piano sound signal or signals of any other musical instruments, and synthesized by the synthesizer unit 1422.

At this time, when the user selects an echo function by manipulating the key input means 120, the accompaniment melody synthesized by the synthesizer unit 1422 is echo-processed by the echo signal synthesizer unit 1423 to be output.

The accompaniment melody outputted from the accompaniment melody synthesizing means 142 is converted into an analogue signal by the digital-to-analogue converter 143, filtered through the filter 144, and amplified by the amplifier 145 to thereafter be outputted to a fixing terminal (a1) of the switch 160 through the mixing

means 149.

Where, in case the user allows the melody stored in the accompaniment melody store means 141 to be outputted to sing a song, the moving terminal of the switch 160 is electrically connected to the fixing terminal (a1) by the system controller 110.

5 Then, the accompniment melody outputted from the mixing means 149 is outputted through the switch 160 and converted into a FM signal by the transmitting means 170 to be wirelessly transmitted via the antenna 180.

In this state, when a user sings a song to the accompaniment of the melody outputted an audio system, the song sound signal is input to the microphone 146 to be
10 amplified by the amplifier 147, and is echo-processed by the echo means 148 in response to the system controller 110 to thereafter be input to the mixing means 149.

The mixing means 149 serves to mix the accompaniment melody outputted from the amplifier 145 with the song sound signal outputted from the echo means 148. The sound signal mixed by the mixing means 149 is outputted via the switch 160, and
15 converted into a FM signal by the transmitting means 170 to thereafter be transmitted wirelessly via the antenna 180.

During such operations, the mixed sound (voice) signal of the accompaniment melody outputted from the mixing means 149 is converted into a digital signal by the analogue-to-digital converter 151 of the record and playback means 150 and inputted
20 into the memory unit 152,. The memory unit 152 successively stores the digital signals outputted from the analogue-to-digital converter 151 in response to address signals outputted from the system controller 110.

And, the image control data according to the the accompaniment outputted from

the system controller 110 is inputted into the FM modulator 191 and the capacitance of the variable capacitance diode VD varies in response to the image control data, thereby the oscillation time constant predetermined by the variable capacitance diode VD, condenser C2 and coil L1 varies.

5 As a result, the FM-modulated signal is generated while the oscillation frequency of the crystal XTAL varies in response to the image control data, the FM modulation signal of the image control data generated by the FM modulator 191 is amplified through the transistor Q1 and is again amplified through the transistors Q2, Q3 in the second amplifier 193 to thereafter be transmitted through the antenna 180.

10 When the user finishes singing a song and selects playback function by manipulating the key input means 120, the system controller 110 controls the switch 160 so that the moving terminal is electrically connected to the other fixing terminal (b1), and at the same time controls the memory unit 152 of the record and playback means 150 so that the stored signal is outputted in order.

15 The signal outputted from the memory unit 152 is converted into the analogue signal by the digital-to-analogue converter 153 to thereafter be outputted through the switch 160 and is converted into the FM signal by the transmitting means 170 to thereafter be transmitted through the antenna 180.

Fig. 4 is a block diagram showing a receiver according to an embodiment of the
20 present invention.

The receiver 200 comprises a first receiving unit 220 for receiving a mixed voice signal in high frequency received through the antenna 210, a second receiving unit 230 for receiving an image control data in high frequency received through the antenna

210, an image generator 240

for generating a background image and caption image of song words according to the image control data received by the second receiving unit 230, a modulator 250 for modulating the mixed sound (voice) signal received by the first receiving unit 220, the background image and caption image of song words generated by the image generator 240 into a television broadcasting signal to be output, and a switch 260 for selecting a television antenna/CATV signal or a modulation signal of the modulator 250 in response to the control signal to output to the antenna terminal of the television receiver set 300.

The first receiving unit 220 comprises a high-frequency amplifier 221 for amplifying a received signal of the antenna 210, a local oscillator 222 for generating a local oscillating signal, a first mixer 223 for outputting an intermediate-frequency signal by mixing output signals of the high frequency amplifier 221 and the local oscillator 222, an intermediate frequency amplifier 224 for amplifying the intermediate frequency signal outputted by the first mixer 223, a FM detector 225 for detecting a mixed voice signal from the output signal of the intermediate frequency amplifier 224, and an amplifier 226 for amplifying the mixed voice signal detected by the FM detector 225.

The second receiving unit 230 comprises a high-frequency amplifier 231 for amplifying a received signal of the antenna 210, a local oscillator 232 for generating a local oscillating signal, a second mixer 233 for outputting an intermediate-frequency signal by mixing output signals of the high frequency amplifier 231 and the local oscillator 232, an intermediate frequency amplifier 234 for amplifying the intermediate frequency signal outputted by the second mixer 233, a FM detector 235 for detecting an image control data signal from the output signal of the intermediate frequency amplifier 234,

and a wave shaping unit 236 for wave-shaping the image control data detected by the FM detector 235 to transmit it an image generator 240.

According to the receiver 200 of the present invention thus constructed, the high frequency signal transmitted by the microphone 100 is inputted into the first receiving
5 unit 220 and second receiving unit 230 through the antenna 210.

The first receiving unit 220 serves to generate the intermediate frequency signal by amplifying the received high-frequency signal through the high frequency amplifier 221 and mixing it with the local oscillating signal of the local oscillator 222 through the mixer 223.

10 The intermediate frequency signal generated by the mixer 223 is amplified through the intermediate frequency amplifier 224, the mixed voice signal is detected by the FM detector 225, and the detected mixed voice signal is amplified by the amplifier 226 to be output.

The second receiving unit 230 generates the intermediate frequency signal by
15 amplifying the received high-frequency signal through the high-frequency amplifier 231 and mixing it with the local oscillating signal of the local oscillator 232 through the mixer 233.

The intermediate frequency signal generated by the mixer 233 is amplified by the intermediate frequency amplifier 234, the image control data is detected by the FM
20 detector 235, and the the detected image control data is wave-shaped through the wave shaping unit 236 to thereafter be outputted.

The image control data outputted from the second receiving unit 230 is inputted into the image generator 240.

Then, the image generator 240 generates the caption image of song words and the background image corresponding to the image control data to output.

As a result of such construction, the mixed voice signal outputted from the first receiving unit 220 and the background image and caption image of song words
5 outputted from the image generator 240 are inputted into the the audio/video terminal of the television receiver set 300, the television receiver set 300 serves to amplify the inputted mixed audio signal to output it through the speaker and to display the background image and caption image of song words on its screen, thereby a user can sing a song to the accompany of a melody outputted from the speaker, watching the
10 background image and caption image of song words which appear on the screen.

And, the mixed audio signal outputted from the first receiving unit 220 and the background image and caption image of song words outputted from the image generator 240 are inputted into the modulator 250, the modulator 250 modulates the inputted mixed audio signal and the background image and caption image of song words into the
15 television broadcasting signal to output it to a fixing terminal a2 of the switch 260.

The switch 260 enables the moving terminal to be connected to the fixing terminal a2 in response to input of the control signal when the receiver 200 is turned-on, the mixed audio signal modulated by the modulator 250 and images of the background and caption are inputted into the television receiver set, the mixed audio signal is
20 outputted through the speaker, and the background image and the caption image appear on the screen the television receiver set, thus the user can sing a song to the accompaniment of the selected melody outputted from the speaker, watching the background image and caption image on the screen.

In addition, when the receiver 200 is turned-off, the control signal is not inputted so that the moving terminal of the switch 260 is connected to the other fixing terminal b2, and the user can again watch television as usual.

In the foregoing, storing and playing the mixed audio signal resulting from
5 mixing of the accompaniment melody and song voice signal into the record and playback means 150 was explained as an embodiment.

However, the present invention is not restricted to a limit of the record and playback means 150, but can varies in various types. For example, the present invention may be constructed in such a manner that the echo means 148 can be connected to the
10 record and playback means 150 so that only the song sound signal can be stored in the record and playback means 150 and outputted.

As another example, the present invention may be constructed in such a manner that the output signals of the echo means 148 and the amplifier 145 are outputted to two units of the record and playback means 150 in which the song sound signal and
15 accompaniment melody are separately and respectively stored, and when the stored song sound signal and accompaniment melody are played-back, the audio signal and /or accompaniment melody could be selected from the separate two record and playback means 150 to be output.

As the other embodiment, even without providing the microphone 100 with the
20 image control data transmitting means 190, the mixed audio signal of the song voice signal and the accompaniment melody or the song voice signal could be FM-modulated to be transmitted, and alternatively could be recorded and played by the record/playback means 150 to thereafter be FM-modulated to be transmitted, thereby an audio system

provided with a FM receiver receives and outputs the signals transmitted from the microphone 100.

Industrial Application

According to the present invention, the record and playback instrument in the
5 microphone enables a user to store the song sound signal and to output it with the stored accompaniment melody, thereby allowing the user to confirm whether correctly singing a song to the accompaniment of the melody and to improve his capability in singing a song.

According to the present invention, the microphone for automatic
10 accompaniment serves to transmit the accompaniment melody, song voice signal and image control data, and the receiver serves to receive the accompaniment melody and the song voice signal to generate the background image and caption image in response to the image control data to output it to the television receiver set, thereby a stable images appear on the screen of the television receiver set even though the microphone is greatly
15 oscillated.

While the present invention has been particularly shown and described with reference to the particular embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be effected therein without departing from the spirit and scope of the inventions as defined by the appended claims.

20

WHAT IS CLAIMED IS:

1. A microphone and receiver for automatic accompaniment, comprising:
a microphone for automatic accompaniment for FM-modulating a song audio
signal and an accompaniment melody selected from a plurality of already-stored
5 accompaniment melody to transmit the modulated signal and for transmitting an image
control data corresponding to the accompaniment melody;
a receiver for receiving the signal transmitted from the microphone for automatic
accompaniment, outputting the received accompaniment melody and song audio signal
to a television receiver set, generating a caption image of song words and a background
10 image corresponding to the accompaniment melody in response to the received image
control data to thereafter transmit the images to the television receiver set.
2. The microphone and receiver for automatic accompaniment as defined in claim
1, wherein the microphone for automatic accompaniment comprises:
15 a system controller for controlling transmission of the audio signal, selected
accompaniment melody and image control data corresponding to the accompaniment
melody,
key input means for inputting an operation instruction to the system controller,
display means for displaying an operation state in response to control of the
20 system controller,
mixed audio-signal output means for outputting the selected accompaniment
melody and mixing the song audio signal with the accompaniment melody to output,
a switch for outputting selectively the output signals of the output means and the

record and playback means in response to control from the system controller,

transmitting means for converting a signal selected by the switch into a high frequency signal to transmit through an antenna, and

image control data transmitting for FM-modulating the image control data

5 outputted from the system controller to transmit through an antenna.

3. The microphone and receiver for automatic accompaniment as defined in claim 1, wherein the accompaniment/song audio signal output means comprises:

accompaniment melody store means for storing a plurality of accompaniment
10 melody to thereafter output a selected accompaniment melody in response to control of the system controller,

accompaniment melody synthesizing means for processing the accompaniment melody output from the accompaniment melody store means in response to control of the system controller to synthesize and output a corresponding echo signal,

15 a digital-to-analogue converter for converting an output signal of the accompaniment melody synthesizing means into an analogue signal,

a filter for filtering the output signal of the digital-to-analogue converter,

a first amplifier for amplifying an output signal of the filter,

a second amplifier for amplifying an audio signal inputted through the
20 microphone,

echo means for echoing an output signal of the second amplifier in response to control of the system controller, and

mixing means for mixing output signals of the first amplifier and echo mean

4. The microphone and receiver for automatic accompaniment as defined in claim 3, wherein the accompaniment melody synthesizing means comprises:

a digital signal process unit for converting the accompaniment melody output from the accompaniment melody store means into a digital signal,

5 an accompaniment melody synthesizer unit for synthesizing an output signal of the digital signal process unit into an accompaniment melody signal, and

echo signal synthesizer unit for echoing a signal synthesized in the accompaniment melody synthesizer unit in response to a user's selection.

10 5. The microphone and receiver for automatic accompaniment as defined in claim 2, wherein the microphone for automatic accompaniment comprises:

a record and playback means for storing and outputting the output signal of the mixed audio signal in response to the control of the system controller, and

15 a switch for allowing to select the mixed audio signal outputted from the mixed audio signal output means to transmit to the transmitting means, and input the output signal of the record/playback means into the transmitting means.

6. The microphone and receiver for automatic accompaniment as defined in claim 5, wherein the record and playback means serves to store and output a mixed audio

20 signal of an audio signal and an accompaniment melody output from the mixed audio signal output means.

7. The microphone and receiver for automatic accompaniment as defined in claim

5, wherein the record and playback means serves to store and output a song audio signal output from the mixed audio signal output means.

8. The microphone and receiver for automatic accompaniment as defined in claim

5 5, wherein the record and playback means stores the song audio signal and accompaniment melody outputted from the mixed audio signal output means and/or the mixed signal of the song audio signal and the accompaniment melody to selectively output .

10 9. The microphone and receiver for automatic accompaniment as defined in one of claims 5 to 8, wherein the record and playback means comprises an analogue-to-digital converter for converting an output signal of the output means into a digital signal, a memory unit for storing and outputting the output signal of the analogue-to-digital converter in response to control of the system controller, and a digital-to-analogue
15 converter for converting an output signal of the memory unit into an analogue signal to thereafter output it.

10. The microphone and receiver for automatic accompaniment as defined in claim 1, wherein the receiver comprises:

20 a first receiving unit for receiving a mixed audio signal transmitted by the microphone and a song audio signal,

a second receiving unit for receiving an image control data transmitted through the microphone,

an image generator for generating a background image and caption image of song words according to the image control data received by the second receiving unit, a modulator for modulating the background image and caption image of song words generated by the image generator into a television broadcasting signal to be output to the television receiver set.

11. The microphone and receiver for automatic accompaniment as defined in claim 10, wherein the receiver includes a switch which allows to input the output signal of the modulator into the television receiver set while electric power is turned-on and to input the television antenna and CATV signals into the television receiver set while electric power is turned-off.

12. A microphone for automatic accompaniment comprising:
a system controller for controlling, storing and playing output of a song audio signal and selected accompaniment melody,

key input means for inputting an operation instruction to the system controller,
display means for displaying an operation state in response to control of the system controller,

mixed audio-signal output means for outputting the selected accompaniment melody and mixing the song audio signal with the accompaniment melody to output, record and playback means for storing and outputting the output signal of the accompaniment melody/song audio signal output means in response to control of the system controller,

a switch for outputting selectively the output signals of the accompaniment/song audio signal output means and the record and playback means in response to control of the system controller, and

transmitting means for converting a signal selected by the switch into a high
5 frequency signal to transmit through an antenna.

13. The microphone for automatic accompaniment as defined in claim 12, wherein the record and playback means stores and outputs a mixed signal of the accompaniment melody and the song audio signal.

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14. The microphone for automatic accompaniment defined in claim 12, wherein the record and playback means stores and outputs the audio signal outputted from the accompaniment/song audio signal output means.

15 15. The microphone for automatic accompaniment as defined in claim 12, wherein the record and playback means stores and outputs selectively the song audio signal outputted from the output means and the mixed signal of the song audio signal and the accompaniment melody.

20 16. The microphone for automatic accompaniment as defined in one of claims 12 to 15, wherein the record and playback means comprises an analogue-to-digital converter for converting an output signal of the accompaniment/song audio signal output means into a digital signal, a memory unit for storing and outputting the output signal of the

analogue-to-digital converter in response to control of the system controller, and a digital-to-analogue converter for converting an output signal of the memory unit into an analogue signal to thereafter output it.

- 5 17. The microphone for automatic accompaniment as defined in claim 12, wherein the accompaniment/song audio signal output means comprises:

accompaniment melody store means for storing accompaniment melody data to thereafter output a selected accompaniment melody in response to control of the system controller,

- 10 accompaniment melody synthesizing means for processing the accompaniment melody output from the accompaniment melody store means in response to control of the system controller to synthesize and output a corresponding echo signal,

a digital-to-analogue converter for converting an output signal of the accompaniment melody synthesizing means into an analogue signal,

- 15 a filter for filtering the output signal of the digital-to-analogue converter,
a first amplifier for amplifying an output signal of the filter,
a second amplifier for amplifying an audio signal inputted through a microphone,
echo means for echoing an output signal of the second amplifier in response to control of the system controller, and

- 20 mixing means for mixing output signals of the first amplifier and echo means

18. The microphone for automatic accompaniment as defined in claim 17, wherein the accompaniment melody synthesizing means comprises:

a digital signal process unit for convertting the accompaniment melody output from the accompaniment melody store means into a digital signal,

an accompaniment melody synthesizer unit for synthesizing an output signal of the digital signal process unit into an accompaniment melody signal, and

5 echo signal synthesizer unit for echoing a signal synthesized through the accompaniment melody synthesizer unit in response to a user's selection.

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FIG. 1

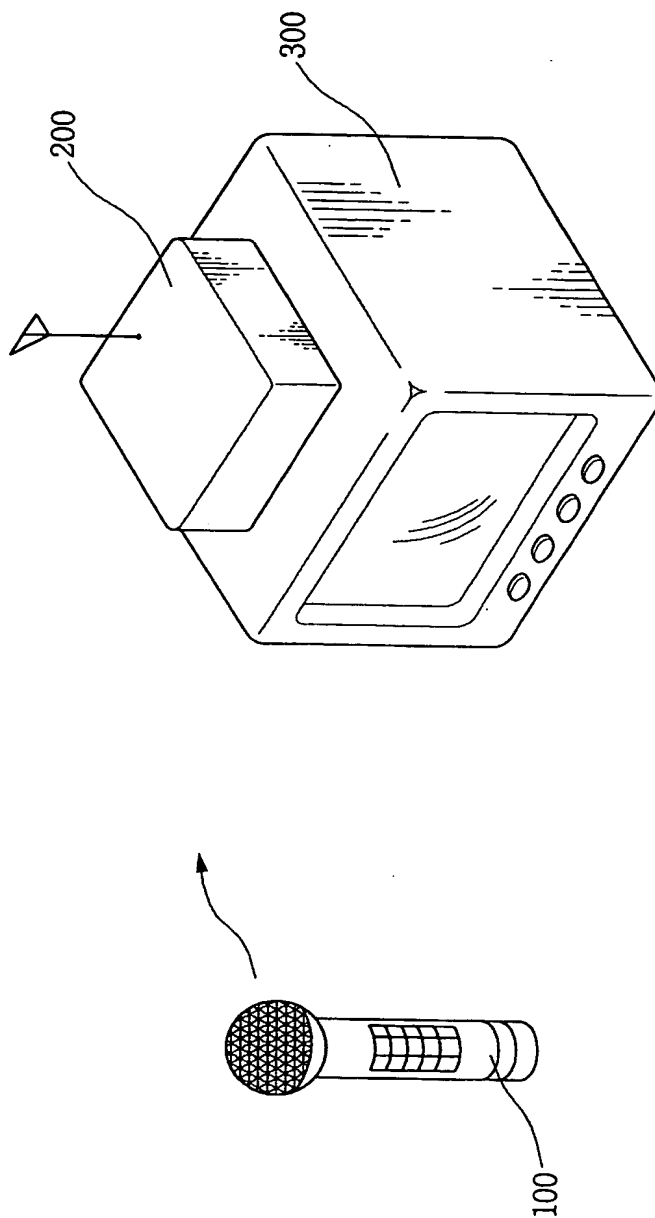


FIG. 2

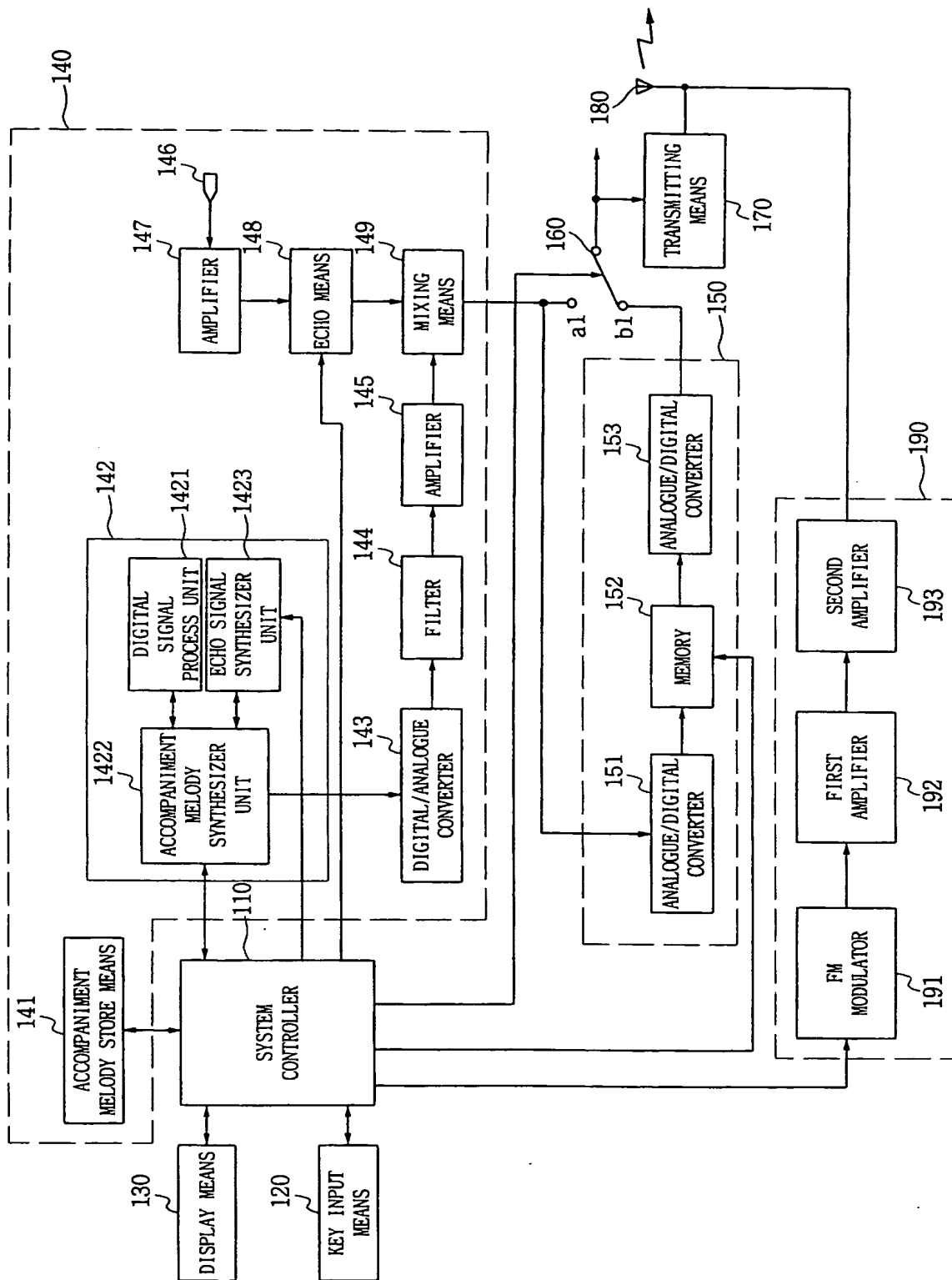
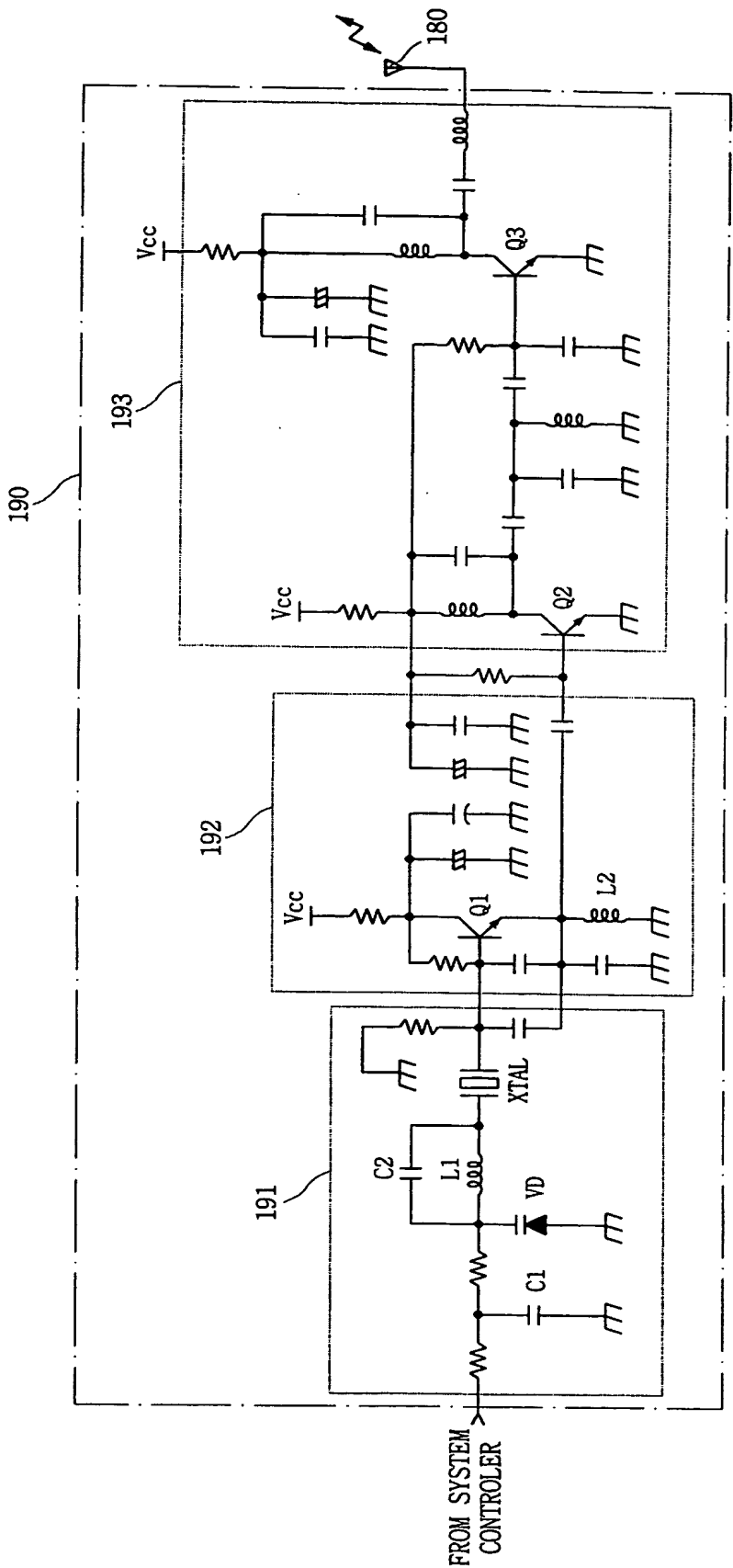
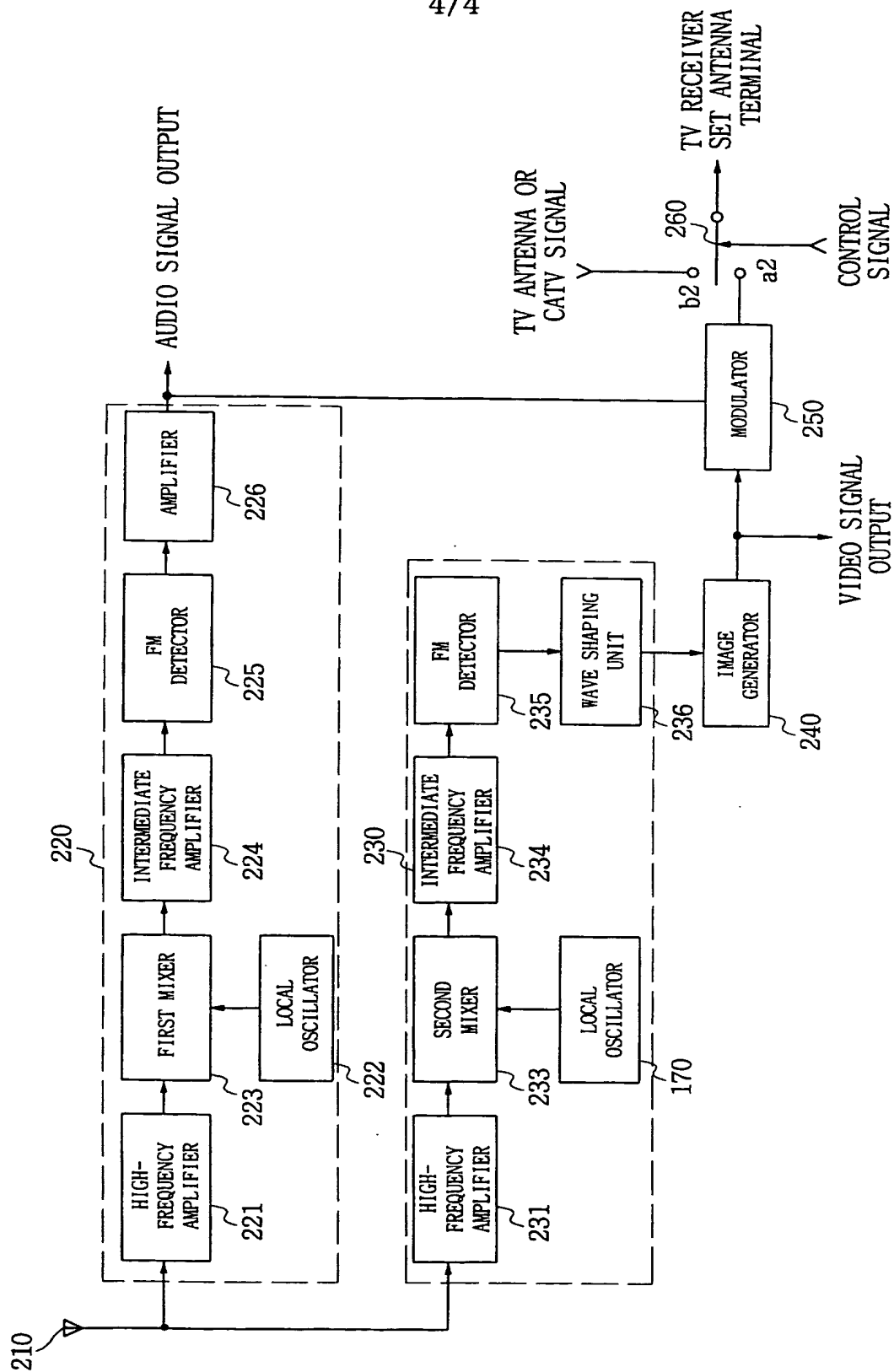


FIG. 3



4/4

FIG. 4



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR 98/00397

A. CLASSIFICATION OF SUBJECT MATTER

IPC⁶: H 04 R 3/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC⁶: H 04 R 3/00, 3/12

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

H 04 R 25/00; H 04 N 7/08; G 10 H 1/00

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 806 798 A1 (LEE), 12 November 1997 (12.11.97).	1,12
A	WO 97/01 243 A1 (UNIVERSAL KOMMUNICATIONS), 31 May 1996 (31.05.96).	1,12
A	US 5 430 803 A (KIMURA et al.), 04 July 1995 (04.07.95).	1,12

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

„A“ document defining the general state of the art which is not considered to be of particular relevance

„E“ earlier application or patent but published on or after the international filing date

„L“ document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

„O“ document referring to an oral disclosure, use, exhibition or other means

„P“ document published prior to the international filing date but later than the priority date claimed

„T“ later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

„X“ document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

„Y“ document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

„&“ document member of the same patent family

Date of the actual completion of the international search

28 July 1999 (28.07.99)

Date of mailing of the international search report

05 August 1999 (05.08.99)

Name and mailing address of the ISA/AT
Austrian Patent Office
Kohlmarkt 8-10; A-1014 Vienna
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Grössing

Telephone No. 1/53424/386

Form PCT/ISA/210 (second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR 98/00397

All documents retrieved show the combination of microphone and receiver devices for automatic accompaniment which can be used for karaoke-like applications including combination with television applications.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR 98/00397

Im Recherchenbericht angeführtes Patentdokument Patent document cited in search report Document de brevet cité dans le rapport de recherche		Datum der Veröffentlichung Publication date Date de publication		Mitglied(er) der Patentfamilie Patent family member(s) Membre(s) de la famille de brevets		Datum der Veröffentlichung Publication date Date de publication	
EP A1	806798			EP A2	806798	12-11-1997	
				JF A2	10064986	06-03-1998	
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				EP B1	671862	20-09-1995	
				JP A2	6319190	15-11-1994	
				DE T2	69400018	23-05-1996	

EUROPEAN PATENT OFFICE

Patent Abstracts of Japan

PUBLICATION NUMBER : 08163686
PUBLICATION DATE : 21-06-96

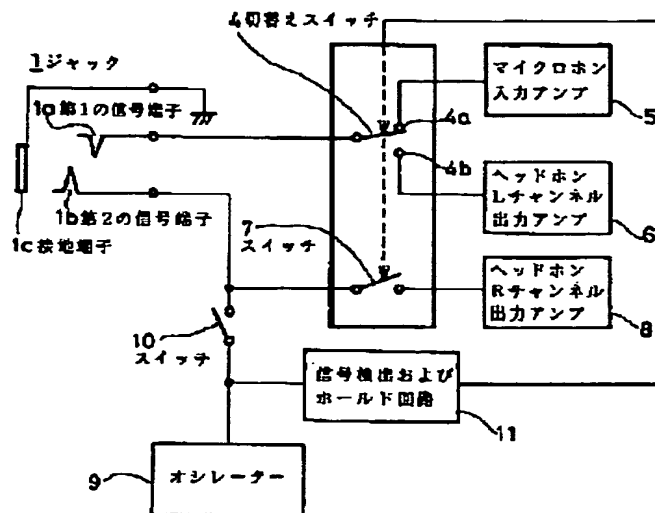
APPLICATION DATE : 30-11-94
APPLICATION NUMBER : 06297511

APPLICANT : SONY CORP;

INVENTOR : NAKAMURA KAZUHIKO;

INT.CL. : H04R 1/10 H04R 1/06

TITLE : INPUT/OUTPUT CIRCUIT FOR AUDIO EQUIPMENT



ABSTRACT : PURPOSE: To narrow an installing area on a front panel by using the connection jack of a headphone also as that of a microphone.

CONSTITUTION: The signal terminal 1a of a jack 1 is connected to the movable contact of a changeover switch 4. Moreover, the fixed contact 4a of the changeover switch 4 is connected to a microphone input amplifier 5, and the fixed contact 4b to the left(L) channel output amplifier 6 of the headphone. Also, the second signal terminal 1b of the jack 1 is connected to the right(R) channel output amplifier 8 of the headphone via a switch 7. Also, the ground terminal 1c of the jack 1 is grounded. Moreover, the output of an arbitrary oscillator 9 is connected to the second signal terminal 1b. Also, the output of the oscillator 9 is connected to a signal detection and hold circuit 11, and the output of the signal detection and hold circuit 11 is connected to the changeover switch 4 and the control part of the switch 7.

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